

## CLAIMS

1. A fire-retardant styrenic resin composition comprising

(A) 100 parts by weight of a styrenic resin having a residue after thermal weight loss of below 20% at 500°C, and

(B) 0.5 to 50 parts by weight of a halogen compound-free fire retardant component,

said component (B) having a molecular weight of 200 to 2000, being dispersed in the form of circular or oval particles having an area-average particle size of 0.01 to 3  $\mu\text{m}$  in the component (A), having a residue after thermal weight loss of 20% or more at 500°C and having a melting point of 100 to 400°C.

2. The fire-retardant styrenic resin composition according to Claim 1, wherein the component (A) is a rubber-modified styrenic resin, and a rubber-like polymer dispersed in the component (A) has an area-average particle size of 0.1 to 2.5  $\mu\text{m}$  and satisfies the following formula (1):

$$0.01 \leq (D_f/D_r) \leq 1.0 \quad (1)$$

wherein  $D_f$  is an area-average particle size of the component (B) and  $D_r$  is an area-average particle size of the rubber-like polymer dispersed in the component (A).

3. The fire-retardant styrenic resin composition

according to Claim 1 or 2, wherein the component (A) is a rubber-modified styrenic resin and the composition comprises 100 parts by weight of the component (A) and 0.5 to 20 parts by weight of the component (B).

4. The fire-retardant styrenic resin composition according to any one of Claims 1 to 3, wherein the component (A) is a rubber-modified styrenic resin, the composition comprises 100 parts by weight of the component (A) and 0.5 to 10 parts by weight of the component (B), and the rubber-like polymer dispersed in the component (A) has an area-average particle size of 0.1 to 2.5  $\mu\text{m}$  and satisfies the following formula (2):

$$0.04 \leq (D_f/D_r) \leq 1.0 \quad (2)$$

wherein  $D_f$  is an area-average particle size of the component (B) and  $D_r$  is an area-average particle size of the rubber-like polymer dispersed in the component (A).

5. The fire-retardant styrenic resin composition according to any one of Claims 1 to 4, wherein the component (A) is a rubber-modified styrenic resin comprising a blend of a rubber-modified polystyrenic resin and polyphenylene ether, the content of the rubber-modified polystyrenic resin in the blend being 70% by weight or more.

6. The fire-retardant styrenic resin composition according to Claim 5, wherein the component (A)

consists of a blend comprised of 100 parts by weight of the rubber-modified polystyrenic resin and 0.1 to 45 parts by weight of the polyphenylene ether, the content of the component (B) in the resin composition being 0.5 to 20 parts by weight, and the rubber-like polymer dispersed in the component (A) having an area-average particle size of 0.3 to 2.5  $\mu\text{m}$ .

7. The fire-retardant styrenic resin composition according to Claim 5 or 6, wherein the rubber-modified styrenic resin as component (A) consists of a blend comprised of 100 parts by weight of the rubber-modified polystyrenic resin and 0.1 to 8 parts by weight of the polyphenylene ether, wherein the content of the component (B) in the resin composition is 0.5 to 10 parts by weight.

8. The fire-retardant styrenic resin composition according to any one of Claims 5 to 7, wherein the incorporated part (X) of the polyphenylene ether in the component (A) and the incorporated part (Y) of the component (B) satisfy the following formula (3).

$$0.4 \leq (Y/X) \leq 2.0 \quad (3)$$

9. The fire-retardant styrenic resin composition according to any one of Claims 1 to 8, wherein the component (C), which is a halogen compound-free fire retardant component other than the component (B), is incorporated into the composition in an amount of 0.1

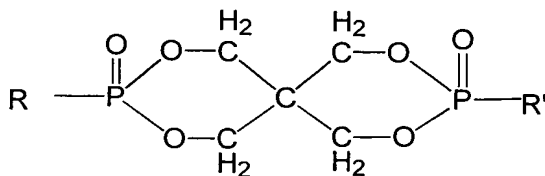
to 40 parts by weight.

10. The fire-retardant styrenic resin composition according to Claim 9, wherein the component (C) is incorporated into the composition in an amount of 0.1 to 10 parts by weight.

11. The fire-retardant styrenic resin composition according to Claim 9 or 10, wherein the content of the component (C) in the composition is not more than that of the component (B).

12. The fire-retardant styrenic resin composition according to any one of Claims 1 to 11, wherein a polymer component (D) comprising an essential structural unit having at least one polar group is further incorporated as a compatibilizer in an amount of 0.2 to 10 parts by weight.

13. The fire-retardant styrenic resin composition according to any one of Claims 1 to 12, wherein the component (B) is a phosphorus-based fire retardant represented by the following formula (4):



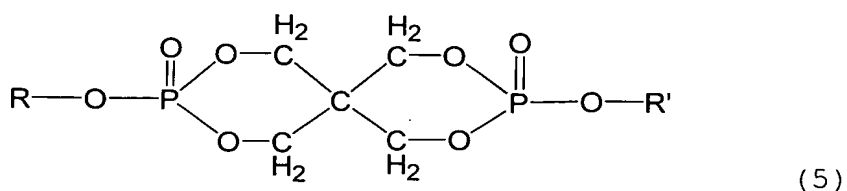
(4)

wherein R and R' are each an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 5 to 10 carbon atoms, an aralkyl group having 7 to 20 carbon atoms or an aryl group having 6 to 15 carbon atoms, and may be

the same or different.

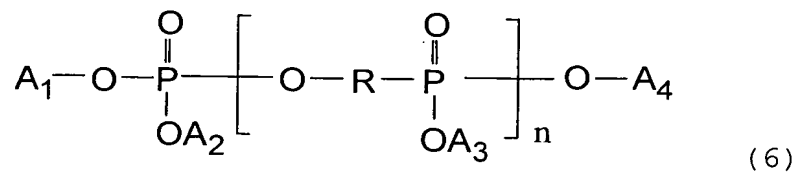
14. The fire-retardant styrenic resin composition according to Claim 13, wherein both R and R' in the formula (4) are a benzyl group.

15. The fire-retardant styrenic resin composition according to any one of Claims 1 to 12, wherein the component (B) is a phosphorus-based fire retardant represented by the following formula (5):



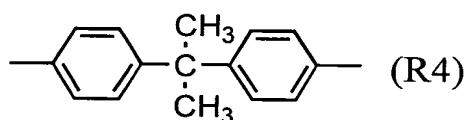
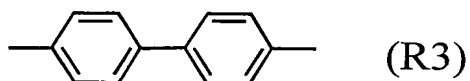
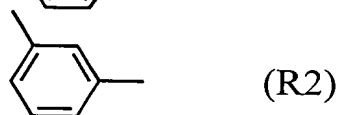
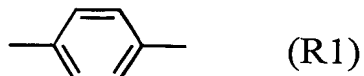
wherein R and R' are each an alkyl group having 1 to 12 carbon atoms, a cycloalkyl group having 5 to 10 carbon atoms, an aralkyl group having 7 to 20 carbon atoms or an aryl group having 6 to 15 carbon atoms, and may be the same or different.

16. The fire-retardant styrenic resin composition according to any one of Claims 7 to 15, wherein the component (C) comprises a compound represented by the following formula (6):



wherein n is an integer of 1 to 10; A<sub>1</sub> to A<sub>4</sub> are each

independently a phenyl, tolyl or xylyl group, and when n is 2 or more, a plurality of A<sub>3</sub>s may be the same or different; and R is a group selected from the group consisting of the following formulas (R1) to (R4).



17. The fire-retardant styrenic resin composition according to any one of Claims 1 to 16, wherein the component (A) is a rubber-modified polystyrenic resin, the content (a) of a rubber-like polymer in the rubber-modified polystyrenic resin is 3 to 15% by weight, the proportion (b) of solvent-insolubles in the rubber-modified polystyrenic resin is 10 to 30% by weight, the formula  $[(b)/(a)] \leq 3.5$  is satisfied, and the swelling index of the rubber-modified polystyrenic resin in toluene is 9.0 to 11.5.

18. The fire-retardant styrenic resin composition according to any one of Claims 1 to 17, wherein the component (A) is a rubber-modified styrenic resin comprising a high cis polybutadiene containing the cis

1,4 bond in an amount of 90% by mole or more, and

wherein the content (a) of a rubber-like polymer in the rubber-modified styrenic resin is 3 to 15% by weight, the proportion (b) of solvent-insolubles in the rubber-modified polystyrenic resin is 10 to 30% by weight, the formula  $2.0 \leq [(b)/(a)] \leq 3.5$  is satisfied, and the rubber-like polymer dispersed in the rubber-modified styrenic resin has an area-average particle size of 0.8 to 2.5  $\mu\text{m}$ , the swelling index of the rubber-modified styrenic resin in toluene being 9.0 to 11.0.

19. The fire-retardant styrenic resin composition according to any one of Claims 1 to 18 which is used for the internal parts of an electric/electronic device satisfying the UL 94 V-2 standard.

20. The fire-retardant styrenic resin composition according to Claim 19 which is used for the internal parts of an electric/electronic device satisfying the UL 94 V-2 standard and having an average thickness of 2 mm or less.

21. The fire-retardant styrenic resin composition according to any one of Claims 1 to 18 which is used for the external parts of an electric/electronic device satisfying the UL 94 V-2 standard.

22. The fire-retardant styrenic resin composition according to Claim 21 which is used for the external parts of an electric/electronic device satisfying the UL 94 V-2 standard and having an average thickness of 2

mm or less.

23. The fire-retardant styrenic resin composition according to any one of Claims 1 to 18 which is used for the external parts of an electric/electronic device satisfying the UL 94 V-0 standard.

24. The fire-retardant styrenic resin composition according to any one of Claims 1 to 18 which is used for the external parts of an electric/electronic device satisfying the UL 94 5V standard.